

## 1.6 Zeros

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Without graphing, determine the **number** of zeros for each of the following polynomials.

1.  $f(x) = 2x^2 - 8x + 6$

2.  $f(x) = x^4 - 2x^2 - 5x + 6$

3.  $f(x) = x^2 - 3x + 2$

4.  $f(x) = -x^3 - x^2 - 5x - 3$

5.  $f(x) = x^3 - 3x + 2$

6.  $f(x) = x^5 - 3x$

Find the zeros of each polynomial.

7.  $f(x) = (x+2)(x-2)(x-3)$

8.  $f(x) = 3x(x+2)(5x-4)$

9.  $f(x) = (x+1)(2x-3)$

Write an equation in factored form for the function with the given zeros.

10.  $x = 4, 7, -2$

11.  $x = 5, 4, -8, -6$

Write an equation in standard form for the function with the given zeros.

12.  $x = 2, -3$

13.  $x = -5, -7$

Factor to find the zeros of each of the following polynomials.

14.  $f(x) = x^2 + 3x - 10$

15.  $f(x) = x^2 - 36$

16.  $f(x) = 3x^2 - 7x - 6$

17.  $f(x) = x^2 + 10x + 24$

For each of the given polynomials, determine which of the binomials listed are factors. There may be more than one answer.

18.  $f(x) = -2x^2 + 15x - 7$

a)  $x + 1$

b)  $x - 7$

c)  $x - 2$

19.  $f(x) = x^3 + 3x^2 - 4x - 12$

a)  $x + 2$

b)  $x - 2$

c)  $x + 3$

Simplify.

20.  $\sqrt{25}$

21.  $\sqrt{12}$

22.  $\sqrt{96}$

23.  $\sqrt{360}$

24.  $3\sqrt{50}$

25.  $6\sqrt{25}$

Use the quadratic formula to find the zeros of each polynomial. Leave in radical form.

26.  $f(x) = -4x^2 + 3x + 1$

27.  $f(x) = -5x^2 - 2x + 3$

28.  $f(x) = 3x^2 + 6x - 13$

29.  $f(x) = x^2 - 8x - 4$

Simplify each of the following radicals.

30.  $\sqrt{32}$

31.  $\sqrt{-25}$

32.  $\sqrt{-72}$

33.  $\sqrt{-45}$

Simplify.

34.  $(-6i)(-5i)$

35.  $3(2i)(-4i)$

36.  $(-2i)(2i)$

37.  $(5i)(5i)$

38.  $(3+i)(5-2i)$

39.  $(x-i)(x+i)$

40.  $(x-7i)(x+7i)$

41.  $(x-3-2i)(x-3+2i)$

42.  $(x-4-i)(x-4+i)$

43.  $(x-5-2i)(x-5+2i)$

Factor each expression over the complex numbers. Write your answer in factored form!

44.  $f(x) = x^2 - 4x + 5$

45.  $f(x) = x^2 - 2x + 10$

46.  $f(x) = x^2 + 4x + 8$

47.  $f(x) = x^2 + 9$

48.  $f(x) = x^2 + 4x + 7$

49.  $f(x) = x^2 + 64$

50.  $f(x) = 2x^2 + 6x + 5$

51.  $f(x) = 9x^2 - 6x + 5$